October 2001

Singapore

Singapore is a major refining center for Southeast Asia, with refining capacity of more than double its rate of petroleum products consumption. It also is strategically located near the Strait of Malacca, a major route for oil tankers.

Note: The information contained in this report is the best available as of October 2001 and can change.

GENERAL BACKGROUND

Singapore's strategic location at the entrance to the Strait of Malacca has helped it to become one of the most important shipping centers in Asia. The Port of Singapore, the world's busiest in terms of shipping tonnage, is a key component of Singapore's prosperity and economic health. Singapore also is a leader in new biotechnologies, petroleum refining, and the manufacturing of computer components.

Recognizing that Singapore's future growth depends on overcoming resource limitations and a small domestic market, the Singaporean government has vigorously encouraged local firms to regionalize their operations and to invest abroad. Prime Minister Goh Chok Tong has identified China, India, and the ASEAN countries as priority countries in the regionalization drive.

Singapore made an impressive recovery after the Asian financial crisis of 1997-98, but has suffered a sharp decline in demand for its exports as a result of the global economic slowdown of 2001 and declining demand for computer hardware, which is a major part of the country's manufacturing sector. Singapore's real gross domestic product (GDP) is projected to shrink by 2.0% in 2001, but recover to a positive 2.5% growth rate in 2002. The Singaporean government announced a $6.2 billion economic stimulus package in October

2001, including tax cuts and increases in government spending on infrastructure projects.

OIL

Singapore is one of the major petroleum refining centers of Asia, with total crude oil refining capacity of 1.3 million barrels per day (bbl/d). According to the Singaporean Statistical Information Services, the refinery business in Singapore comprised over 12% of its manufacturing sector in 2000.

The Asian economic crisis of 1997-98 had a negative impact on Singapore's refining industry, and Singapore's refining companies lost significant business due to declining demand for oil products in the region. While the region staged a recovery from the financial crisis in 1999 and 2000, the construction of new refineries in Singapore's traditional export markets has had a more enduring negative effect. Recent refinery expansions in several of its traditional markets also are hurting Singapore's exports. New refineries in India, particularly the 540,000-bbl/d Reliance Petroleum refinery at Jamnagar which began production in 2000, have reduced Indian demand for imports of refined products. The new Melaka refining complex in Malaysia also has become a competitor. The Chinese government's drive to curb petroleum products smuggling into southern China and to protect domestic refiners also have been negative development for refiners. Finally, the global economic slowdown of 2001 has negatively affected Singapore's refining sector. As of September 2001, Singaporean refineries were operating at only 63% of their total capacity.

In response to these pressures, individual refinery operators in Singapore are exploring different restructuring measures. For instance, Shell has centralized control of its Asian refining operations in Singapore. Caltex has followed a similar strategy. Other Singaporean refiners are exploring approaches ranging from large run cutbacks to cost cutting in an effort to boost margins.

Retail prices for petroleum products in Singapore have fallen sharply in 2001. This is mainly a result of the decline in world crude oil prices, but also a reflection of strong competition between Singapore's refiners and retailers.

Petrochemicals

The rapid growth of Singapore's petrochemical industry has been a direct result of the country's strong base in petroleum refining. In 1999, Singapore's chemical industry accounted for about 10% of the nation's total manufacturing output. A large project to reclaim seven islands to form a 12-square mile petrochemical complex on Jurong Island is in progress. This project will provide more land to support the growth of petrochemicals and chemical industries.

Recent major developments in the petrochemical industry in Singapore include the start up of a second naphtha cracker by the Petrochemical Corporation of Singapore and its downstream partners, Phillips Petroleum, The Polyolefin Company, Hoechst, and Seraya Chemicals. In addition, Germany's Messer Group and U.S.-based Texaco have built a $200-million synthetic gas plant on Jurong Island. The synthetic gas is being used for industrial purposes and as feedstock for petrochemical and refining customers on Jurong Island.

NATURAL GAS

Singapore imports all of its natural gas, which is mainly used for power generation and as a feedstock for petrochemical production. Natural gas use is rising rapidly, as the Singaporean government promotes policies aimed at reducing carbon and sulfur emissions, ensuring energy security, and promoting the country as a regional hub for an integrated gas pipeline network. Singapore Power currently imports 155 million cubic feet per day (Mmcf/d) of Malaysian gas through a transnational pipeline, which was the first of its kind in Asia.

Singapore has embarked on a diversification strategy so it will not become dependent on a single source for gas imports. In January 1999, the Singaporean gas consortium, SembGas, (which consists of SembCorp Engineering, Tuas Power, EDB International, and Belgium's Tractebel) signed an agreement to purchase West Natuna gas from Indonesian state energy company Pertamina. SembGas will purchase 325 Mmcfd of

natural gas for 22 years, through a pipeline from the West Natuna gas fields to Singapore. Deliveries of gas through the pipeline began in January 2001.

Another firm contract was signed for supplies to PowerGas from Pertamina in February 2001. The 20-year contract calls for supplies of 150 Mmcf/d to begin in 2003, rising to 350 Mmcf/d by 2009. The gas will come from deposits on the Indonesian island of Sumatra. The subsea pipeline linking Sumatra to Singapore is expected to cost $300 million.

In addition to gas imports from Malaysia and the two planned pipelines from Indonesia, Singapore has plans to build an LNG import terminal, thereby freeing itself from complete dependence on neighboring states for its gas supply. The Singaporean government announced in September 1999 that it has set aside land at Tuas View for the project. In the last two years, however, the project has made little progress. It is still under review.

Singapore may eventually become important as a regional gas hub for Southeast Asia. The idea of a regional gas grid for members of the Association of Southeast Asian Nations (ASEAN) has been under discussion for several years, and international links already exist or are under construction between Burma and Thailand, between Malaysia and Thailand, and between Indonesia and Singapore. Singapore has an ideal location to function as the hub of such a system if it comes to fruition.

ELECTRIC POWER

Singapore is in the process of restructuring and privatizing its electric power sector, which will transform what was a monopoly into a competitive market. Two subsidiaries of state-owned Singapore Power, PowerSeraya and PowerSenoko, along with Tuas Power, are currently generating electricity. PowerGrid, another subsidiary of Singapore Power, maintains and operates the country's electricity transmission and distribution system. The Singaporean government currently owns majority stakes in all of these firms through holding companies.

Under the restructuring plan, Singapore Power will be divesting PowerSeraya, PowerSenoko, and Tuas Power in the first half of 2002, retaining only the electricity transmission and distribution networks and its gas distribution subsidiaries. Tuas Power, owned by the government through state holding company Temesek Holdings, was slated for divestment in 1999, but the process was delayed, as the government re-evaluated the proper structure and sequencing of the overall privatization process. The process is now expected to move forward in late 2001. It will be open to foreign bidders, and several foreign utilities are among the firms which have prequalified for the bidding process.

A regulatory agency for the country's electric utility sector, the Energy Markets Authority (EMA) was created in April 2001. It is working out the details of the privatization process.

Gas importer SembCorp already has entered the power generation business as an independent power producer (IPP), completing the construction of a 815-megawatt (MW) gas-fired plant under the name SembCorp Cogen. The facility began operation in September 2001. Malaysia's Tenaga Nasional has expressed interest in entering Singapore's power market after deregulation. It would either sell power from its grid in Malaysia to customers in Singapore, or possibly purchase generation assets in Singapore.

Most of the state-owned utilities' generating capacity has been converted from fuel oil to natural gas as it has become available. Most new planned capacity also will burn natural gas. Tuas Power recently contracted with Mitsubishi for two 367-MW combined cycle generating units, which are to be completed in 2006. With the current economic downturn, however, some other capacity expansion projects have been called into question, at least in the short term.

Sources for this report include: CIA World Factbook 2001; Dow Jones News Wire service; Economist Intelligence Unit ViewsWire; Oil & Gas Journal; Petroleum Intelligence Weekly; Platt's Oilgram News; Reuters News Wire; Straits Times; U.S. Energy Information Administration; U.S. Department of State; DRI-

WEFA Asia Economic Outlook.

COUNTRY OVERVIEW

President: Sellapan Rama Nathan (since 1999)
Prime Minister: Goh Chok Tong (since 1990)
Senior Minister: Lee Kuan Yew
Independence: August 9, 1965
Population (2001E): 4.3 million
Location/Size: Singapore lies in Southeast Asia, with Peninsular Malaysia to the north, East Malaysia to the east, and Indonesia to the south. The country consists of one main island and 54 islets located approximately 77 miles north of the equator.
Major Cities: Singapore
Language: Chinese, English, Malay, and Tamil
Ethnic Groups: Chinese (77%); Malay (14%); Indian (8%)
Defense (1998): 53,900 total active armed forces (221,000 reservists). Army: 45,000 personnel (210,000 reservists); Navy: 2,900 personnel (3,600 reservists); Air Force: 6,000 personnel (7,500 reservists)

ECONOMIC OVERVIEW

Currency: Singapore dollar
Exchange Rate (10/23/00): 1.83 Singapore dollars = 1 U.S Dollar
Real GDP Growth Rate (2000E): 9.9% **(2001E):** -2.0%
Inflation Rate (consumer prices) (2000E): 1.4% **(2001E):** 1.2%
Current Account Balance (2001E): $15.5 billion
Merchandise Trade Balance (2001E): $9.7 billion
Major Exports: Machinery, petroleum and petroleum products, chemicals, telecommunications equipment, computer equipment, food and live animals, crude rubber, beverages, tobacco, clothing.
Major Imports: Machinery and transportation equipment, petroleum and petroleum products, crude materials, foodstuffs, tobacco, textiles, iron and steel, aircraft.
Top Trading Partners: Hong Kong, Japan, Malaysia, Taiwan, Thailand, United States
Total Reserves, Non-Gold (2001E): $4.4 billion

ENERGY OVERVIEW

Oil Consumption (2000E): 602,000 barrels per day (bbl/d) (all imported)
Crude Oil Refining Capacity (1/1/01E): 1.3 million bbl/d
Natural Gas Consumption (1999E): 53 billion cubic feet (Bcf) (all imported)
Electric Generation Capacity (1/1/99E): 5.5 gigawatts (all thermal)
Electricity Generation (1999E): 27.4 billion kilowatt hours

ENVIRONMENTAL OVERVIEW

Minister of the Environment: Yock Suan Lee
Total Energy Consumption (1999E): 1.4 quadrillion Btu* (0.4% of world total energy consumption)
Energy-Related Carbon Emissions (1999E): 25.5 million metric tons of carbon (0.4% of world carbon emissions)
Per Capita Energy Consumption (1999E): 341.7 million Btu (vs. U.S. value of 355.8 million Btu)
Per Capita Carbon Emissions (1999E): 6.4 metric tons of carbon (vs. U.S. value of 5.5 metric tons of carbon)
Energy Intensity (1999E): 19,455 Btu/$1990 (vs U.S. value of 12,638 Btu/$1990)**
Carbon Intensity (1999E): 0.36 metric tons of carbon/thousand $1990 (vs U.S. value of 0.19 metric tons/thousand $1990)**
Sectoral Share of Energy Consumption (1998E): Transportation (61.2%), Industrial (30.8%), Commercial (4.8%), Residential (3.2%)
Sectoral Share of Carbon Emissions (1998E): Industrial (58.3%), Transportation (26.5%), Commercial (9.1%), Residential (6.1%)
Fuel Share of Energy Consumption (1999E): Oil (95.9%), Natural Gas (4.1%), Coal (0.0%)
Fuel Share of Carbon Emissions (1999E): Oil (96.9%), Natural Gas (3.1%), Coal (0.0%)

Renewable Energy Consumption (1998E): 2.9 trillion Btu* (60% decrease from 1997)
Number of People per Motor Vehicle (1998): 6 (vs. U.S. value of 1.3)
Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified May 29th, 1997). Not a signatory to the Kyoto Protocol.
Major Environmental Issues: Industrial pollution; limited natural fresh water resources; limited land availability presents waste disposal problems; seasonal smoke/haze resulting from forest fires in Indonesia.
Major International Environmental Agreements: A party to Conventions on Biodiversity, Climate Change, Endangered Species, Hazardous Wastes, Law of the Sea, Nuclear Test Ban, Ozone Layer Protection and Ship Pollution.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.
**GDP based on EIA International Energy Annual 1999

ENERGY INDUSTRY

State Energy Companies: Singapore National Oil Company; Singapore Petroleum Company; Singapore Power Company; PowerSeraya; PowerSenoko; Tuas Power; PowerGas
Major Refineries (1/1/01 Capacity): Esso Singapore Pty. Ltd. (265,000 bbl/d); Mobil Oil Singapore Pty. Ltd. (300,000 bbl/d); Shell Eastern Petroleum (Pte.) Ltd. (405,000 bbl/d) Singapore Refining Co. Ltd. (285,000 bbl/d).
Major Ports: Singapore

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